

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application;

--1. (Currently Amended) A receiving apparatus for receiving optical information, comprising:

a light receiving element array having a plurality of light receiving elements arranged in an array for receiving the optical information that is dispersed within a spatially predetermined range and that corresponds to a plurality of bits of parallel data fed to a plurality of light emitting diodes arranged in an array and for outputting a plurality of electric signals at levels corresponding to amounts of light in the received optical information, wherein the light receiving elements output the plurality of electric signals in parallel;

an information extraction circuit for receiving the plurality of electric signals output in parallel from the light receiving element array and extracting information in accordance with the optical information based on the plurality of electric signals[[.]]; and

an optical system for condensing the optical information to a predetermined region of a light receiving region of the light receiving element array, wherein

the optical system is capable of adjusting a position of a light axis direction based on a control signal; and

the information extraction circuit outputs the control signal for adjusting the position of the light axis direction

to the optical system when information in accordance with the optical information cannot be extracted based on the plurality of electric signals.

--2. and 3. (Cancelled)

--4. (Previously Presented) The receiving apparatus as set forth in claim 1, wherein a wavelength of the optical information is within a visible wavelength range.

--5 - 8. (Cancelled)

--9. (Previously Presented) The receiving apparatus as set forth in claim 1, wherein the information extraction circuit comprises:

a binarizing circuit for binarizing the plurality of electric signals from the light receiving element array;

a data selection circuit for selecting data corresponding to the optical information from the plurality of binarized electric signals from the binarizing circuit; and

a conversion circuit for decoding data corresponding to the optical information selected by the data selection circuit and converting it from parallel data to serial data.

--10. (Currently Amended) The receiving apparatus as set forth in claim [[2]] 1, wherein the information extraction circuit comprises:

a binarizing circuit for binarizing the plurality of

electric signals from the light receiving element array;

a data selection circuit for selecting data corresponding to the optical information from the plurality of binarized electric signals from the binarizing circuit; and

a conversion circuit for decoding data corresponding to the optical information selected by the data selection circuit and converting it from parallel data to serial data.

--11. (Currently Amended) The receiving apparatus as set forth in claim [[7]] 1, wherein the information extraction circuit comprises:

a binarizing circuit for binarizing the plurality of electric signals from the light receiving element array;

a data selection circuit for selecting data corresponding to the optical information from the plurality of binarized electric signals from the binarizing circuit; and

a conversion circuit for decoding data corresponding to the optical information selected by the data selection circuit and converting it from parallel data to serial data.

--12. (Previously Presented) The receiving apparatus as set forth in claim 4, wherein the information extraction circuit comprises:

a binarizing circuit for binarizing the plurality of electric signals from the light receiving element array;

a data selection circuit for selecting data corresponding to the optical information from the plurality of binarized

electric signals from the binarizing circuit; and

a conversion circuit for decoding data corresponding to the optical information selected by the data selection circuit and converting it from parallel data to serial data.

--13. and 14. (Cancelled)

--15. (Currently Amended) A communication system, comprising:

a transmitting apparatus for transmitting optical information in the form of a light beam dispersed in a spatially predetermined range formed by an array of a plurality of light emitting diodes corresponding to a number of bits of parallel input data, wherein a level of light emission from the plurality of light emitting diodes is in accordance with bit information of the parallel input data; and

a receiving apparatus including a light receiving element array having a plurality of light receiving elements arranged in an array for receiving the light beam and outputting a plurality of electric signals at levels corresponding to amounts of light received, wherein the light receiving elements output electric signals in parallel, and an information extraction circuit for receiving a plurality of electric signals output in parallel from the light receiving element array and extracting information in accordance with the optical information signal based on the plurality of electric signals[[]], wherein

the receiving apparatus comprises an optical system for condensing the light beam to a predetermined region of a light receiving region of the light receiving element array, and wherein

the optical system is capable of adjusting a position of a light axis direction based on a control signal; and

the information extraction circuit outputs the control signal for adjusting the position of the light axis direction to the optical system when information in accordance with the optical information cannot be extracted based on the plurality of electric signals.

--16. and 17. (Cancelled)

--18. (Previously Presented) The communication system as set forth in claim 15, wherein a wavelength of the light beam transmitted by said transmitting apparatus is within a visible wavelength range.

--19 - 22. (Cancelled)

--23. (Previously Presented) The communication system as set forth in claim 15, wherein the information extraction circuit of the receiving apparatus comprises:

a binarizing circuit for binarizing the plurality of electric signals from the light receiving element array;

a data selection circuit for selecting data corresponding

to the optical information from the plurality of binarized electric signals from the binarizing circuit; and

a conversion circuit for decoding data corresponding to the optical information selected by said data selection circuit and converting it from parallel data to serial data.

--24. (Currently Amended) The communication system as set forth in claim [[16]] 15, wherein the information extraction circuit of the receiving apparatus comprises:

a binarizing circuit for binarizing the plurality of electric signals from the light receiving element array;

a data selection circuit for selecting data corresponding to the optical information from the plurality of binarized electric signals data from the binarizing circuit; and

a conversion circuit for decoding data corresponding to the optical information selected by said data selection circuit and converting it from parallel data to serial data.

--25. (Currently Amended) ~~[[The]]~~ A communication system ~~as set forth in claim 17, comprising:~~

a transmitting apparatus for transmitting optical information in the form of a light beam dispersed in a spatially predetermined range formed by an array of a plurality of light emitting diodes corresponding to a number of bits of parallel input data, wherein a level of light emission from the plurality of light emitting diodes is in accordance with bit information of the parallel input data;
and

a receiving apparatus including a light receiving element array having a plurality of light receiving elements arranged in an array for receiving the light beam and outputting a plurality of electric signals at levels corresponding to amounts of light received, wherein the light receiving elements output electric signals in parallel, and an information extraction circuit for receiving a plurality of electric signals output in parallel from the light receiving element array and extracting information in accordance with the optical information signal based on the plurality of electric signals,

wherein the receiving apparatus comprises an optical system for condensing the light beam to a predetermined region of a light receiving region of the light receiving element array,

wherein the optical system is capable of adjusting a position of a light axis direction based on a control signal; and

the information extraction circuit outputs the control signal for adjusting the position of the light axis direction to the optical system when information in accordance with the optical information cannot be extracted based on the plurality of electric signals, and

wherein the information extraction circuit of the receiving apparatus comprises:

a binarizing circuit for binarizing the plurality of electric signals from the light receiving element array;

a data selection circuit for selecting data corresponding to the optical information from the plurality of binarized electric signals from the binarizing circuit; and

a conversion circuit for decoding data corresponding to the optical information selected by said data selection circuit and converting it from parallel data to serial data.

--26. (Previously Presented) The communication system as set forth in claim 18, wherein the information extraction circuit of the receiving apparatus comprises:

a binarizing circuit for binarizing the plurality of electric signals from the light receiving element array;

a data selection circuit for selecting data corresponding to the optical information from the plurality of binarized electric signals from the binarizing circuit; and

a conversion circuit for decoding data corresponding to the optical information selected by said data selection circuit and converting it from parallel data to serial data.

--27. (Currently Amended) A communication system, comprising:

a transmitting apparatus having a conversion circuit for converting serially input data to a plurality of bits of parallel data and a light emitting diode array having a plurality of light emitting diodes corresponding to the plurality of bits of parallel data from the conversion circuit, wherein the light emitting diodes are arranged in an array and are respectively controlled in light emission in

parallel based on bit information of the corresponding plurality of bits of parallel data to emit optical information in the form of a light beam dispersed in a spatially predetermined range; and

a receiving apparatus including a light receiving element array having a plurality of light receiving elements arranged in an array for receiving the light beam outputting a plurality of electric signals at levels corresponding to amounts of light received, wherein the light receiving elements output a plurality of electric signals in parallel, and an information extraction circuit for receiving the plurality of electric signals output in parallel from the light receiving element array and extracting information in accordance with the optical information based on the plurality of electric signals[[.]]₁

wherein the receiving apparatus comprises an optical system for condensing the light beam to a predetermined region of a light receiving region of the light receiving element array, and

wherein the optical system is capable of adjusting a position of a light axis direction based on a control signal; and

the information extraction circuit outputs the control signal for adjusting the position of the light axis direction to the optical system when information in accordance with the optical information cannot be extracted based on the plurality of electric signals.

--28. and 29. (Cancelled)

--30. (Previously Presented) The communication system as set forth in claim 27, wherein a wavelength of the light beam transmitted by said transmitting apparatus is within a visible wavelength range.

--31. (Previously Presented) The communication system as set forth in claim 27, wherein the information extraction circuit of the receiving apparatus comprises:

a binarizing circuit for binarizing the plurality of electric signals from the light receiving element array;

a data selection circuit for selecting data corresponding to the optical information from the plurality of binarized electric signals from the binarizing circuit; and

a conversion circuit for decoding data corresponding to the optical information selected by said data selection circuit and converting it from parallel data to serial data.

--32. (Currently Amended) The communication system as set forth in claim ~~[[28]]~~ 27, wherein the information extraction circuit of the receiving apparatus comprises:

a binarizing circuit for binarizing the plurality of electric signals from the light receiving element array;

a data selection circuit for selecting data corresponding to the optical information from the plurality of binarized electric signals from the binarizing circuit; and

a conversion circuit for decoding data corresponding to the optical information selected by said data selection circuit and converting it from parallel data to serial data.

--33. (Currently Amended) [[The]] A communication system as set forth in claim 29, comprising:

a transmitting apparatus having a conversion circuit for converting serially input data to a plurality of bits of parallel data and a light emitting diode array having a plurality of light emitting diodes corresponding to the plurality of bits of parallel data from the conversion circuit, wherein the light emitting diodes are arranged in an array and are respectively controlled in light emission in parallel based on bit information of the corresponding plurality of bits of parallel data to emit optical information in the form of a light beam dispersed in a spatially predetermined range; and

a receiving apparatus including a light receiving element array having a plurality of light receiving elements arranged in an array for receiving the light beam outputting a plurality of electric signals at levels corresponding to amounts of light received, wherein the light receiving elements output a plurality of electric signals in parallel, and an information extraction circuit for receiving the plurality of electric signals output in parallel from the light receiving element array and extracting information in accordance with the optical information based on the plurality

of electric signals,

wherein the receiving apparatus comprises an optical system for condensing the light beam to a predetermined region of a light receiving region of the light receiving element array, and

wherein the optical system is capable of adjusting a position of a light axis direction based on a control signal; and

the information extraction circuit outputs the control signal for adjusting the position of the light axis direction to the optical system when information in accordance with the optical information cannot be extracted based on the plurality of electric signals,

wherein the information extraction circuit of the receiving apparatus comprises:

a binarizing circuit for binarizing the plurality of electric signals from the light receiving element array;

a data selection circuit for selecting data corresponding to the optical information from the plurality of binarized electric signals from the binarizing circuit; and

a conversion circuit for decoding data corresponding to the optical information selected by said data selection circuit and converting it from parallel data to serial data.